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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,044	03/04/2002	Timothy J. Shepodd	SD-8345	6501

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TIMOTHY P. EVANS  
Sandia National Laboratories  
MS 9031  
7011 East Avenue  
Livermore, CA 94550

EXAMINER
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THEXTON, MATTHEW

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/091,044

Applicant(s)

SHEPODD ET AL.

Examiner

Matthew A. Thexton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2004 May 10, RCE.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

**DETAILED ACTION*****Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2004 April 12 has been entered.

***Text of US Code Not Repeated If Recited in Prior Office Action(s)***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Specification, New Matter Objection***

The amendment filed 2004 April 12 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The paragraph and Table 4 inserted at page 11 are not supported by the original disclosure.

The single pressure value in the originally filed description is about 10 Torr (equivalent to about 0.0132 atmosphere). The original disclosure of efficacy at about 10 Torr is not considered to be indicative of efficacy for all pressures up to about 760 Torr (equivalent to 1 atmosphere). There is no indication in the original disclosure of an

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appreciation of an invention comprising of hydrogen (partial) pressure up to 76 times greater than disclosed (750 % greater).

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112, New Matter***

Claims 1-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no discussion in the application as filed of the concept of a composition or method using same "at a pressure of less than about 1 atmosphere" as found in each of claims 1, 12, and 23, all of the independent claims. The single pressure value in the originally filed description is about 10 Torr (equivalent to about 0.0132 atmosphere). This is cited by applicant in the response as the basis for the cited limitation (in quotations, above). The original disclosure of efficacy at about 10 Torr is not considered to be indicative of efficacy for all pressures up to about 760 Torr (equivalent to 1 atmosphere). There is no indication in the original disclosure of an appreciation of an invention comprising of hydrogen (partial) pressure up to 76 times greater than disclosed (750 % greater).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 requires one step, "providing" to satisfy the preamble "method of absorbing hydrogen." This is vague and indefinite because there is no action that brings the hydrogen in contact with the composition. Inserting the wording "contacting said composition with a source of hydrogen" before "wherein" would overcome this rejection.

### ***Rejections - 35 USC § 103***

Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shepodd, et al. (US 5624598) in view of Streitwieser, Jr., et al. and Morikawa, et al. (US 6018048).

The Shepodd reference discloses the general application of getting hydrogen using an appropriately matched hydrogenation catalyst and hydrogenation susceptible compound. Further, the reference discloses systems which employ high surface area carriers and/or binders and fillers to permit utility in various environments. This reference appears to disclose all of the elements of all of the claims except for the particular hydrogenation susceptible compound, the polyphenyl ether. Shepodd discloses methods absorbing (claims 12-22) comprising "providing."

The Streitwieser reference discusses the well known catalytic hydrogenation chemistry of substituted benzenes, setting forth the caveat that some functional groups will hydrogenate preferentially, including "COR" which is an ether.

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The Morikawa reference discloses catalytic hydrogenation of phenyl ether to saturate the aromatic portion (column 9, line 39 and 43) and employs temperatures up to 300 degree Celsius (column 12, lines 20-33). The ethers suggested in Morikawa actually are derivatives of benzene, since it is the aromatic functionality which is the focus of the hydrogenation (column 9, lines 17-20). In view of Morikawa et al., the Streitwieser, Jr., et al. caveat is not a counter suggestion when the ether is bis-phenyl, rather it suggests that the aromatic or double bonds will preferentially hydrogenate. In view of the references taken together, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed poly-phenyl ethers as catalytic hydrogenation compounds in the techniques taught by Shepodd et al. in order to obtain their higher temperature stability and with a reasonable expectation of success. The claims include a limitation that the polyphenyl ether is comprised of at least 3 basic structural units. While this is different than the bis-phenyl ether specifically set forth in Morikawa et al., it is clear that the Morikawa reference stands for all its teachings, not just the exemplified or listed species. Poly-phenyl ether is so structurally similar to diphenyl ether and is suggested by the broad class of compounds "benzene and its derivatives" (column 9, lines 19-20) that it would be an obvious variation and choice due to its close chemical structure.

Morikawa et al. teach hydrogen partial pressure of one atmosphere to 200 atmospheres for the method. This is not a point of distinction for the claimed compositions or the methods as claimed because given the disclosures of Shepodd, Streitwieser, and Morikawa simultaneously, one of ordinary skill in the art would have a

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reasonable expectation of success at pressure less than about 1 atmosphere. One of ordinary skill in the art would understand that Morikawa is disclosing economic limitations, not functional limitations for diffusion moderated reactions in gettering situations as disclosed by Shepodd. Furthermore, Morikawa suggests that the hydrogen may be less than pure (column 12, lines 41-44) which would result in lower hydrogen partial pressure.

Claims 23-34 require the same composition with the limitation that it have the property of absorbing hydrogen from hydrogen/oxygen mixtures. Physical properties are inherent to the obvious formulations. The Morikawa reference suggests is that the catalytic activity may be inhibited by oxygen or oxygen containing gases (column 12, lines 15-19). Here again, one of ordinary skill in the art would be considering the full disclosure of Morikawa in view of Shepodd and Streitwieser. It is concluded that one of ordinary skill in the art would not have been de-motivated from employing the functional formulations suggested by Morikawa because oxygen appears to be competing or inhibiting but not destroying the efficacy of the formulation.

### ***Response to Arguments and Remarks***

Applicant's remarks forming a part of the amendment filed 2004 April 12 begin at page 3 thereof.

Applicant's assertion that no new matter is added is noted. This is not found convincing. The only asserted basis for the material rejected and objected to as new matter is original claim 1 and Table 2 (page 10) wherein rates of hydrogenation are given for various temperatures at a total hydrogen pressure of 10 Torr. This single

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pressure value does not evidence that the concept of hydrogenation at all pressures up to about 1 atmosphere was in the possession of Applicant at the time of the originally filed application.

Applicant notes that the amendment to the specification provides experimental verification that hydrogenation occurs in the range between 10 and 760 Torr. This fails to address the position taken that such information is new matter.

Applicant notes that the Morikawa reference explicitly states that at hydrogen pressure below 1 atmosphere no "sufficient" hydrogenation rate can be obtained (column 12, lines 26-32). While this is true, it fails to consider the context or construct of the statement of rejection or the of the reference. As noted in the statement of rejection hereinabove, Shepodd suggests hydrogenation reactants for hydrogen gettering at sub-atmospheric conditions, which would lead one of ordinary skill to liberally interpret the Morikawa disclosure outside of its strict constraints which are informed by the economic considerations (column 12, lines 26-32) surrounding rapidly making hydrogenated products. Furthermore, Morikawa suggests that the hydrogen may be less than pure (column 12, lines 41-44) which would result in lower hydrogen partial pressure.

Applicant reiterates the argument that claims 23-33 are explicitly taught away by Morikawa. As indicated in the statement of rejection, Morikawa does not teach away, but cautions that some performance loss might occur. Applicant urges that Morikawa discloses noble metal Raney catalyst, while the Shepodd reference discloses noble metal catalysts which renders these disclosures un-combinable. This line of reasoning



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is not understood since the Raney noble metal catalysts appear to be encompassed by the noble metal catalysts of the Shepodd reference and the present claims.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Thexton whose telephone number is 571-272-1125. The examiner can normally be reached on Monday-Friday, 9:30 to 6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasudevan S Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Matthew A. Thexton  
Primary Examiner  
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